Competitiveness of Banana Chipping Agro-industry in Lumajang Regency, Indonesia

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Abstract

The aim of this research is to identify the competitiveness of the banana chipping industry in Lumajang Regency, Indonesia. Research was undertaken in the center of production and processing in Lumajang Regency from September to December 2007. Primary data was collected by interviewing banana chip processors and collector agents. Secondary data was obtained from the Office of Dinas Pertanian and Dinas Koperasi and Usaha Kecil Menengah in Lumajang Regency. The collected data was then tabulated and analyzed descriptively. The results show that the banana chipping industry in Lumajang Regency is primarily a small-scale or home industry. However, the industry does provide numerous households with a significant amount of income and provides employment for many women. At the village level, the banana chip industry directly supports the marketing of fresh bananas. Factors that support the banana chipping industry include (1) a sufficient and continuous supply of raw material, (2) emerging opportunities in the banana chip market, (3) a cheap and simple processing technology, (4) the relatively small investment required, and (5) the support of local government. To improve competitiveness and to accommodate consumers' changing tastes, quality and the processing technology must be improved and the market expanded through promotion.

Keywords: agro-industry; banana chips; income

Introduction

According to Hicks (1995), agro-industry development is characterized by (1) increasing added value; (2) production of more marketable, usable, or consumable products; (3) increasing shelf life, and (4) increasing income of the smallholder producers. Agro-industry development must be supported by the availability of sufficient amounts of raw material of the desired quality in order to achieve the continuity of production (Herlina, 2007).

Banana chips are one of the major commodities produced in Lumajang Regency, Indonesia (Dinas Pertanian Kabupaten Lumajang, 2005). Largely due to the efforts of the local government to popularize the commodity, Lumajang Regency is emerging as the center of the banana chipping industry in East Java.

The two key districts are Senduro and Pasrujambe. The agro-ecological conditions in both areas are similar: (1) 500–750 m above sea level, (2) average temperature range of 15–35°C, (3) alluvial soil, and (4) a type C climate (Balai Pengkajian Teknologi Pertanian Jawa Timur, 1996).

The two major cultivars of banana cultivated in Lumajang Regency are Mas (for fresh consumption) and Agung (for cooking). There are many other cultivars such as Susu and Ambon for fresh consumption, and Raja, Kepok and Embug for cooking (Table 1).

Two cultivars of banana are used for making banana chips: Agung and Embug. In 2006, around 28,000 tonnes of Agung and 58,000 tonnes of Embug were harvested in Lumajang Regency. The productivity of Embug averages 15 kg per plant, while Agung averages 10 kg per plant. Because of the greater supply of Embug banana and its superior cooking characteristics,

Table 1. Banana planted area, yield, and productivity in Lumajang Regency (2006)

Cultivar	Planting area (ha)	Yield (tonnes)	Productivity (kg/plant)
Mas	399	25,929	10
Agung	456	28,333	10
Susu	290	15,092	10
Ambon	428	44,492	20
Raja	466	36,367	15
Kepok	702	72,992	20
Embug	747	58,330	15
Others	499	38,880	15
Total	3,987	320,415	

processors use a greater quantity of Embug (around 400 kg per day) compared to 100 kg per day of Agung.

At this level of production, the supply of both bananas is sufficient to guarantee a continuous supply of raw material to the banana chipping industry. Furthermore, as the raw material is readily available, the prices are relatively stable. While it is important for the industry to be based on the suitability of the land and the climate, the industry must also be adequately supported by an agribusiness subsystem (Kasijadi et al., 1999). In this respect, the support of local government has been instrumental in developing the banana chipping business in Lumajang Regency (Sa'id, 2004). Not only does the banana chipping industry support the fresh banana market, but it also adds considerable value to the commodity itself through changes in the product form. According to the Office of Dinas Koperasi dan Usaha Kecil Menengah Kabupaten Lumajang (2006), there are some 12 listed banana chipping enterprises in Lumajang Regency and a further 13 unlisted processors. Throughout Indonesia, banana chips are sold in small shops, kiosks, and supermarkets.

The aim of this research was to explore the competitiveness of the banana chipping agro-industry in Lumajang Regency with a view to facilitating its ongoing development.

Materials and Methods

The research was done in Lumajang Regency, the center of banana production in East Java between September to December 2007. Primary data was collected by interviewing banana farmers, processors, and collector agents. There were 4 key informants from each group. Secondary data were collected from the Office of Dinas Pertanian, the Office of Dinas Koperasi dan Usaha Kecil Menengah in Lumajang Regency, and other references.

Results and Discussion

The Performance of the Banana Chip Industry

The presence of the banana chip industry in Lumajang Regency plays a critical role in the banana agribusiness. There are 25 banana chip processors in Lumajang Regency, all of which are classified as small (Dinas Koperasi dan Usaha Kecil Menengah Lumajang Regency, 2006). The processors are usually easy to reach and most are located 1 to 5 km from the banana producers. The proximity greatly facilitates the supply of raw material and greatly reduces any damage to the bananas in transit.

The total requirement for fresh banana is estimated to be 3,750 tonnes per year, which is comprised of 750 tonnes of Agung and 3,000 tonnes of Embug.

There is, within Lumajang Regency, an abundant supply of raw material. Most of the bananas for processing (80%) are supplied by collector agents, and 20% are supplied directly to the processors by the farmers themselves. The collector agents are generally located in the Senduro and Pasrujambe markets.

The collector agents supply the processors up to three times a week, but the production process occurs every day, on average, for 25 working days every month or 300 working days per year. The volume of the fresh banana needed by each processor per day is 500 kg of fresh banana, consisting of 100 kg of Agung and 400 kg of Embug (Table 2).

The transportation of the raw material from the collector agents and the farmers to the processors is generally done by open vehicle with the capacity of 1 ton. Transportation costs are borne by the suppliers. The price of the raw materials at the factory door is Rp 1,000 per kg for Agung and Rp 550 per kg for Embug. This is paid by the processors to both the collector agents and those farmers who chose to supply directly. Payment is usually made in cash upon receipt of the goods.

The desired specifications for the raw material of banana are uniform size and 80% maturity, still unripe.

Technology Application

The processing of banana chips is commonly done using a simple traditional method, technology, and equipment. The stages of processing are the following: selection of the fresh banana, peeling the banana, slicing the banana, washing, frying, seasoning, and packing.

The selection of the raw material is based on the maturity of the fruit. Fruit that is too young will produce tasteless and pale banana chips, while fruit that is too ripe will blacken and have a poor texture. The peeling of the banana skin and slicing are done manually. However, the form of the Agung banana slice is different from the Embug. Agung is sliced round while Embug is sliced long. However, the thickness of the slice is the same (about 2 mm). The sliced fruit is then washed in water to remove the sap and fried in a large

Table 2. Average fresh banana need as raw material for banana chip agro-industry in Lumajang Regency

Cultivar	Total need (kg)		
	Per process	Per month (25 times process)	Per year (300 times process)
Agung	100	2,500	30,000
Embug	400	10,000	120,000
Total	500	12,500	150,000

frying pan with the capacity of 3 kg raw banana. The cooked chips are then seasoned with spices such as sugar, salt, and garlic and then packed. Plastic bags are used in many different sizes depending on the requirements of the target market. For grocery stores, the chips are usually packed in plastic bags with a capacity of 5 kg.

An Economic Analysis of the Banana Chip Industry

The cost of production to process the raw banana into chips includes the raw material cost and the workers' wages. The raw material costs include raw banana; gasoline; frying oil; spices such as sugar, salt, and garlic; and plastic bags (Table 3).

The total cost for one unit of production (one day) is Rp 1,044,500, which is made up of material costs (Rp 964,500) and wages for 4 women workers (Rp 80,000). With 25 working days in a month, the cost of materials and wages amounts to Rp 26,112,500 per month or Rp 313,350,000 per year (Table 4).

Besides the cost of materials, other simple equipment like a stove, a frying pan, a sealer, a slicer, a drying pail, and a knife are required. For these items, the annual depreciation approaches Rp 616,000 per year (Table 5).

Including annual depreciation and tax, the average production cost for producing banana chips in Lumajang Regency amounts to Rp 314,316,000

Table 3. Raw material needed for the production of banana chips in Lumajang Regency for one process

Material	Quantity	Value (Rp)
Cultivar		
Agung[a] (kg)	100	100,000
Embug[b] (kg)	400	220,000
Gasoline (L)	20	50,000
Frying oil (L)	30	457,500
Sugar (kg)	10	55,000
Salt (kg)	-	2,000
Garlic (kg)	5	25,000
Plastic bag (pieces)	200	50,000
Others	-	5,000
Total	-	964,500

[a] Price of Agung = Rp 1,000 • kg^{-1}

[b] Price of Embug = Rp 550 • kg^{-1}

Table 4. Material costs and workers wages in one process, one month, and one year in banana chips production

Description	Values (Rp)		
	1 day production process	1 month production process[a]	1 year production process[b]
Materials cost (Rp)	964,500	24,112,500	289,350,000
Workers wages (Rp)	80,000	2,000,000	24,000,000
Total materials cost and workers wages (Rp)	1,044,500	26,112,500	313,350,000

[a] One month production is 25 times production process (25 working days per month).
[b] One year production is 300 times production process (300 working days per year).

Table 5. The annual depreciation of the equipment used in banana chip processing in Lumajang Regency

Equipment	Number	Value (Rp)	Economic age (year)	Annual depreciation (Rp)
Stove	3	690,000	5	138,000
Frying pan	3	525,000	5	105,000
Sealer	2	600,000	10	60,000
Drying spoon	5	150,000	3	50,000
Slicer	2	800,000	10	3,000
Plastic pail	20	1,200,000	5	240,000
Knife	12	60,000	3	20,000
Total of the annual depreciation (Rp)				616,000

per year. With sales approaching Rp 16,000 per kg of Embug chips and Rp 22,000 per kg for Agung, the average annual return approaches Rp 412,800,000. After costs, the net return to the business is Rp 98,484,000 per year (Table 6).

The conversion rate from fresh banana to chips is 16–17% for both Agung and Embug. To produce 1 kg of chips, some 5.80–6.25 kg of fresh bananas is required.

Market opportunities for the banana chip are high. The chips are mostly purchased by traders (75%) who come to Lumajang Regency. They generally

Table 6. Economic analyses of banana chips agro-industry in Lumajang Regency in one year

Description	Rp/year
Annual depreciation of the equipments	616,000
Tax	350,000
Raw materials	289,350,000
Workers' wages	24,000,000
Total cost	314,316,000
Banana chips production value[a]	412,800,000
Agung (4,800 kg)	105,600,000
Embug (19,200 kg)	307,200,000
Income	98,484,000

[a] Price of chips per kg: Agung = Rp 22,000, Embug = Rp 16,000.

buy in bulk (5-kg bags). The balance (25%) is sold either to local markets (5%) or other cities like Malang, Jember, Probolinggo, and Surabaya (20%). For these markets, the product is generally sold in 400-g plastic bags.

Conclusions

The banana chip industry in Lumajang Regency is only a small-scale industry, yet it provides a relatively high income and employment for many local women. Some factors that support the development of the banana chip industry in Lumajang Regency include (1) a sufficient and continuous supply of raw material, (2) emerging opportunities in the banana chip market, (3) a cheap and easy processing technology, (4) the relatively small investment required, and (5) the support of local government.

However, to remain competitive in the market and to meet consumers' changing tastes, the quality and processing technology must be improved and markets need to be expanded.

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References

Balai Pengkajian Teknologi Pertanian Karangploso. 1996. Zonasi Agroekologi dan Karakterisasi Wilayah-wilayah Kecamatan di Jawa Timur. BPTP Karangploso, Malang.

Dinas Koperasi dan Usaha Kecil Menengah Kabupaten Lumajang. 2006. Laporan Tahunan Dinas Koperasi dan Usaha Kecil Menengah Kabupaten Lumajang Tahun 2005. Lumajang.

Dinas Pertanian Kabupaten Lumajang. 2005. Laporan Tahunan Dinas Pertanian Kabupaten Lumajang Tahun 2004. Lumajang.

Herlina, T. 2007. Peningkatan Nilai Tambah melalui Pengembangan Agroindustri Pisang di Kabupaten Lumajang. Makalah Seminar Agroindustri. Pusat Analisis Sosial Ekonomi dan Kebijakan Pertanian, Bogor.

Hicks, P.A. 1995. An overview of issues and strategies in the development of food processing industries in Asia and the Pacific. APO Symposium, September 28–October 5, Tokyo, Japan.

Kasijadi, F., Wahyunindyawati, Handoko, and Q.D. Ernawanto. 1999. Rakitan Teknologi Usahatani Pisang Kultivar Ambon Kuning di Lahan kering. Dalam Monograf Rakitan Teknologi Pertanian. BPTP Karangploso, Malang.

Sa'id, G. 2004. Manajemen agribisnis. Galia Indonesia, Jakarta.

Swastika. 1994. Azas-Azas Marketing. Liberty, Yogyakarta.